



MEMORANDUM

Date

1/7/04

TO: Dan, Eric, Dave, and Peter

FROM: Jim Pearce

RE: Work Plan for the Wolford Mountain Reservoir Second Enlargement

This memorandum will help develop a scope of work for an initial evaluation of the Wolford Mountain Reservoir second enlargement. The second enlargement could potentially add a significant amount of firm yield to the project. However, the amount of new yield, cost, and permitting issues are not yet known. This evaluation will provide information to help the River District determine if an enlargement is desirable.

We need to know whether or not a second enlargement is worth the trouble. The following main issues require some resolution:

- How much new storage volume will the enlargement add?
- What are the engineering and construction costs for the enlargement,
- What are the permitting issues and costs,
- How does the enlargement comport with the ongoing hydropower project, and
- How should the River District proceed with Denver Water on the enlargement?

The first two bullets are basically engineering details. The last three are a mix of legal, technical, and political concerns. The following outline will provide specifics on how to address the engineering questions and suggest a more general path to help define the permitting and political issues.

As staff discussed, we should complete the preliminary evaluations suggested in this paper before the April 2004 River District Board meeting. The schedule is short because the hydropower preliminary study permit expires the last day of May 2004. We need to determine if the enlargement should precede the hydropower or visa-versa at about that time.

Engineering

The engineering information will help us determine “Go or No go” with respect to the engineering design and construction costs. Our thought is that we can develop the additional storage at bargain price. However, we need to “run the numbers” and make certain the concept is sound.

The premise of the enlargement is to raise the service spillway crest elevation and thereby, the normal operating volume of the reservoir. For every foot of elevation added to the spillway crest, the reservoir volume increases by about 1,500 AF. Based on our current method of estimating the facility’s firm yield, the storage to firm yield ratio is 2 to 1. So, every additional foot on the spillway crest would result in about 750 AF of firm yield.

For the enlargement, the primary engineering consideration is the facility’s ability to pass the inflow design flood (“IDF”), for Welford the probable maximum flood. Under the current design, the service spillway passes approximately 75% of the IDF. Increasing the spillway elevation means that the service spillway would pass less of the IDF and a higher portion would go through the emergency spillway. Consequently, we need to determine how high the service spillway can be raised, while maintaining sufficient capacity to pass the IDF.

An increase in the elevation of the spillway will result in a greater “normal” water elevation in the reservoir. This raises a number of ancillary engineering issues. Our preliminary engineering will also cover:

- Issues concerning the dam crest elevation and dam embankment,
- Potential impacts on:
 - The outlet works tower and bridge from more frequent inundation,
 - The spillway bridge due to higher reservoir water elevation,
 - U.S. Highway 40, and
 - The existing recreational facilities.

To complete this work, the River District will contract with a design engineering firm. Several firms have already expressed interest in doing the work. In the next month, we should develop this scope of work and get a contractor on board. I estimate we should budget \$25,000.

Permitting and Denver Water Issues

There are several important issues regarding permitting and Denver Water’s participation in the project. Based on our very preliminary engineering work, it appears likely that even a 2-foot raise of the spillway would develop additional storage at a bargain price (with respect to engineering and construction costs). Consequently, enlargement project's feasibility hinges on the outcome of several important permitting, legal, and political issues.

Permitting

To construct the enlargement project we must obtain local, state, and federal authorizations. For Wolford Mountain, that probably means modifying the existing permits. To modify the permits we will face NEPA, and consequently, an environmental study to determine the range of impacts for the project. For the enlargement alone we feel that the environmental work would be relatively straightforward.

However, we are beginning the FERC process for the Wolford hydropower project. As explained in the confidential memorandum from Mike McCarty (attached to the General Counsel Confidential Report) tackling both projects is more difficult than either one alone. If changes to permits (Table 1) result in negative impacts to the project overall, then there may be no reason to pursue the enlargement (or on the other hand, the hydropower project). We are evaluating the project authorizations in this light and will develop recommendations for pursuing either one or both projects.

Table 1: List of the Permits for the Wolford Mountain Project

- Grand County 1041 permit,
- Army Corps of Engineers Section 401 “Dredge and Fill”,
- Federal water quality 404 certification,
- Biological Opinion endangered species act,
- Bureau of Reclamation right-of-way,
- Forest Service administrative approval, and
- State Engineer Dam Safety certification.

Denver Water’s Participation

The other major issue is how Denver Water will participate in the enlargement. Denver has expressed interest in participating, but we have not discussed the issue in any detail. We will examine this issue in the upcoming months.